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IS 12140 (1987): Data sheet for selection of dumpers [MED 7: Material Handling Systems and Equipment]

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UDC 621·869·2 : 658·711·6 (083·22) **IS : 12140 - 1987**

Indian Standard

(Reaffirmed 2004)

DATA SHEET FOR SELECTION OF DUMPERS

Bulk Handling Equipment Sectional Committee, EDC 84; Cyclic Loose Bulk Handling Equipment (Non-Stationary) Subcommittee, EDC 84 : 6 [Ref : Doc : EDC 84 (4411)]

1. Scope — Lays down the data required for the selection of dumpers.

2. Data Sheet

2.1 *Application and Site Data*

a) Applicable to: Proposal ________
Date ________
b) Service ________ Continuous/Intermittent;
Days per year ________ days
c) Duty: Operating hours per shift ________ h
Shifts per day ________
d) Method of loading ________
e) Site altitude ________
f) Environment ________ Dusty/foggy/snowy/slushy/clean
g) Relative humidity *Max* at ________ K ________ percent
h) Temperature *Max* ________ K *Min* ________ K
j) Rainfall: Average ________ *Max* ________
k) Area classification ________ Hazardous/Non-Hazardous ________
m) Haul distance ________ m
n) Haul road:
  1) Type ________ Paved/Unpaved
  2) Condition ________ Good/Average/Bad
p) Maximum gradient on haul road ________
q) Maximum number of curves on haul road ________

Note — For (p) and (q), it shall be preferable to give a haul road map.

2.2 *Material Handled Data*

a) Material ________
b) Average size ________ mm
c) Maximum size ________ mm
d) Bulk density (loose) ________ kg/m^3
e) Angle of repose ________
f) Moisture content ________ percentage
g) Temperature ________ K
h) Flowability (flow property) ________
j) Abrasiveness ________
k) Chemical activity ________ Corrosive/hygroscopic
m) Swell factor ________

Adopted 3 August 1987	© April 1988, BIS	Gr 4

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NEW DELHI 110002

2.3 *Engine*

a) Make and model ____________________

b) Type ____________________ Inline/V-type; two stroke/four stroke

c) Cooling system ____________________ Air-cooled/water-cooled

d) Gross power __________ kW at __________ rev/min

e) Flywheel power __________ kW at __________ rev/min

f) Maximum torque __________ Nm at __________ rev/min

g) Specific fuel consumption (SFC) (SFC curve to be provided) at rated load and speed ____________________ g/kWh

h) Nature of aspiration __________ Natural/super-charged/turbo-charged/any other

j) Number of cylinders ____________________

k) Bore (mm) × Stroke (mm) ____________________

m) Displacement ____________________ litres

n) Type of fuel used ____________________

p) Type of fuel pump ____________________

q) Air cleaner: ____________________

1) Type ____________________ Dry/Wet

2) Service indicator ____________________ Provided/Not provided

r) Net weight ____________________ kg

s) Cold starting ____________________

t) Derating factor ____________________

u) Position of engine ____________________ Front/rear

w) Lubricating oil specification ____________________

Note — In case of super-charged and turbo-charged engines, derating factor shall be specified by the manufacturer.

2.4 *Transmission*

a) Make and model ____________________

b) Type __________ Mechanical/hydrostatic/hydrodynamic/electric/other (*specify*)

c) Clutch (dry/wet)/Torque convertor (stage, element, etc)/hydraulic pump and motor/electric drive ____________________

d) Stall ratio (*in case of hydrodynamic transmission*) ____________________

e) Type of drive ____________________ Two wheel/Four wheel

f) Travel speed in km/h ____________________

Direction of Motion or Movement	*Speed Range*				
	First Gear	Second Gear	Third Gear	Fourth Gear	Fifth Gear
Forward					
Reverse					

g) Neutral start ____________________ Provided/Not provided

h) 1) Controls ____________________ Single/Multi-levers

2) Shift ____________________ Manual/Semi-automatic/Automatic

j) Hydraulic system (in case of hydrostatic and hydrodynamic transmission, details of system shall be specified) ____________________

k) Gradeability — laden ____________________ unladen ____________________

Note — For gradeability, a chart shall be provided by the manufacturer.

m) Reverse alarm switch ____________________ Provided/Not provided

2.5 *Front Axle*

a) Make and model ____________________

b) Type ____________________

c) Type of reduction ____________________ Single/Double/Bull gear/Planetary

d) First reduction ratio ____________________

e) Second reduction ratio ____________________

f) Total reduction ratio ____________________

2.6 *Rear Axle*

a) Make and model ____________________

b) Type ____________________

c) Type of reduction ____________________ Single/Double/Bull gear/Planetary

d) First reduction ratio ____________________

e) Second reduction ratio ____________________

f) Total reduction ratio ____________________

2.7 *Front Suspension*

a) Make and model ____________________

b) Type ____________________ Hydro-pneumatic/Spring/Other (*specify*)

c) Deflection/Stroke length *Max* ____________________ mm

d) Size ____________________ (Number of springs and size, etc/size of cylinder, etc)

2.8 *Rear Suspension*

a) Make and model ____________________

b) Type ____________________ Hydro-pneumatic/Spring/Other (*specify*)

c) Deflection/stroke length *Max* ____________________ mm

d) Size ____________________ (Number of springs and size, etc/size of cylinder, etc)

2.9 *Steering*

a) Type ____________________ Mechanical/Hydraulic/Hydraulic assisted/Any other

b) Steering angle on either direction ____________________ ×° ____________________ ×°

c) Number of turns of steering wheel required for steering from lock to lock ____________________

d) *Turning radius*:

1) On front wheel track ____________________ mm

2) For vehicle clearance ____________________ mm

e) Emergency steering: ____________________ Provided/Not provided

1) Make and model ____________________

2) Type ____________________ Accumulator/Electrically driven

2.10 *Steering Hydraulics*

a) Number of cylinders ____________________

b) Bore (mm) × Stroke (mm) ____________________

c) Pump:
1) Type ____________________
2) Capacity ____________ litres per minute at ____________ rev/min
3) Reljef valve setting ____________________ MPa

2.11 *Brakes*

a) Service : Type ____________ Number of pedals ____________
1) Front brake area ____________________ m²
2) Rear brake area ____________________ m²

b) Parking: Type and operation ____________________
Brake area ____________________ m²

c) Emergency:
1) Type and operation ____________________
2) Signalling/Alarm system ____________ Provided/Not provided

d) Ratarder: Type ____________ Tarquomatic/Application of brakes

2.12 *Tyres and Rims*

a) Tyres:
1) Front : Type ________ Size ________ Standard ________ Optional ________
2) Rear : Type ________ Size ________ Standard ________ Optional ________

b) Rim Size:
1) Front ____________________
2) Rear: ____________________

c) Total number of tyres ____________________
d) Inflation pressure : Front tyre ____________________ MPa
Rear tyre ____________________ MPa

2.13 *Hydraulic System*

a) Maximum operating pressure ____________________ MPa
b) System relief pressure ____________________ MPa
c) Hoist cylinder: ____________________
1) Type ____________________
2) Number of cylinders and stages ____________________
3) Size: Bore (mm) X stroke (mm) ____________ X ____________
4) Type of mounting ____________ Outside frame/Inside frame/Inverted

d) Pump: ____________________
1) Type ____________________
2) Capacity ____________ litres per minute at ____________ rev/min

e) Control valve:
1) Make and model ____________________
2) Type ____________________
3) Position ____________ raise/hold/lower/float

f) Filter:
1) Type ____________ Suction/Inline/pressure
2) Construction ____________ Throw-away/Washable element
3) Flow capacity ____________ litres per minute

4) Micron rating ____________________
5) Filter clogging indicator ____________________ Provided/Not provided

2.14 *Hydraulic Cycle Time at Wide Open Throttle*

a) Body raise time (with load) ____________________ s
b) Body raise time (without load) ____________________ s
c) Body lower time (without load) ____________________ s

2.15 *Dump Body*

a) Construction type __________ Standard __________ Optional __________
b) Material:

	Thickness mm	*Yield Strength* MPa	*Hardness* HB
Floor			
Side			
Front			
Slope			

c) Capacity:
1) Struck ____________________ m^3
2) Heaped 2 : 1 ____________________ m^3
2) Heaped 3 : 1 ____________________ m^3

2.16 *Cab*

a) Construction type ____________________
b) Mounting ____________________ Left/Right
c) Visibility ____________________ Percentage
(*Max* glass area)

2.17 *Electrical System*

a) Starting: Type ____________________ Voltage ____________________ V
b) Lighting __________ ; Voltage __________ V; Intensity __________ lx
c) Grounding ____________________ Positive/Negative
d) Charging: Type __________ Alternator/Dynamo; Capacity __________ Ah
e) Battery: Type ____________________ ; Capacity __________ Ah

2.18 *Service Refill Capacities*

a) Cooling system ____________________ litres ____________________ grade
b) Engine crank case ____________________ litres ____________________ grade
c) Transmission: Clutch/Torque convertor __________ litres __________ grade
d) Differential and final drives: Front __________ litres __________ grade
Rear __________ litres __________ grade
e) Hydraulic tank ____________________ litres __________ grade
f) Fuel tank ____________________ litres __________ grade
g) Brake system ____________________ litres __________ grade

2.19 *Operating Data*

a) Pay load ________ kg
b) Maximum rimpull ________ kg

2.20 *Dimensions* (*see* Fig. 1)

a) Length overall (*A*) ________ mm
b) Width overall (*B*) ________ mm
c) Height loading (*C*) ________ mm
d) Height dumping (*D*) ________ mm
e) Body inside width (*E*) ________ mm
f) Body depth *Max* (*F*) ________ mm
g) Body length (*G*) ________ mm
h) Canopy length (*H*) ________ mm
j) Body dump angle (*J*) ________ degrees
k) Wheel base (*K*) ________ mm
m) Front wheel track (*L*) ________ mm
n) Drive wheel track (*M*) ________ mm
p) Width over rear axle tyres (*N*) ________ mm
q) Front bumper clearance (*P*) ________ mm
r) Front drive clearance (*Q*) ________ mm
s) Rear drive clearance (*R*) ________ mm
t) Height overall (*S*) ________ mm

2.21 *Weight* (*Mass*)

a) Chassis with hoist ________ kg
b) Standard body ________ kg
c) Net weight distribution:
  1) Front axle ________ kg
  2) Rear axle ________ kg
  3) Total ________ kg
d) Gross weight distribution:
  1) Front axle ________ kg
  2) Rear axle ________ kg
  3) Total ________ kg

2.22 *Instruments, Gauges and Indicators*:

2.23 *Standard Accessories*:

1) Functional ________
2) Safety ________

2.24 *Optional Accessories*

2.25 *Attachments*

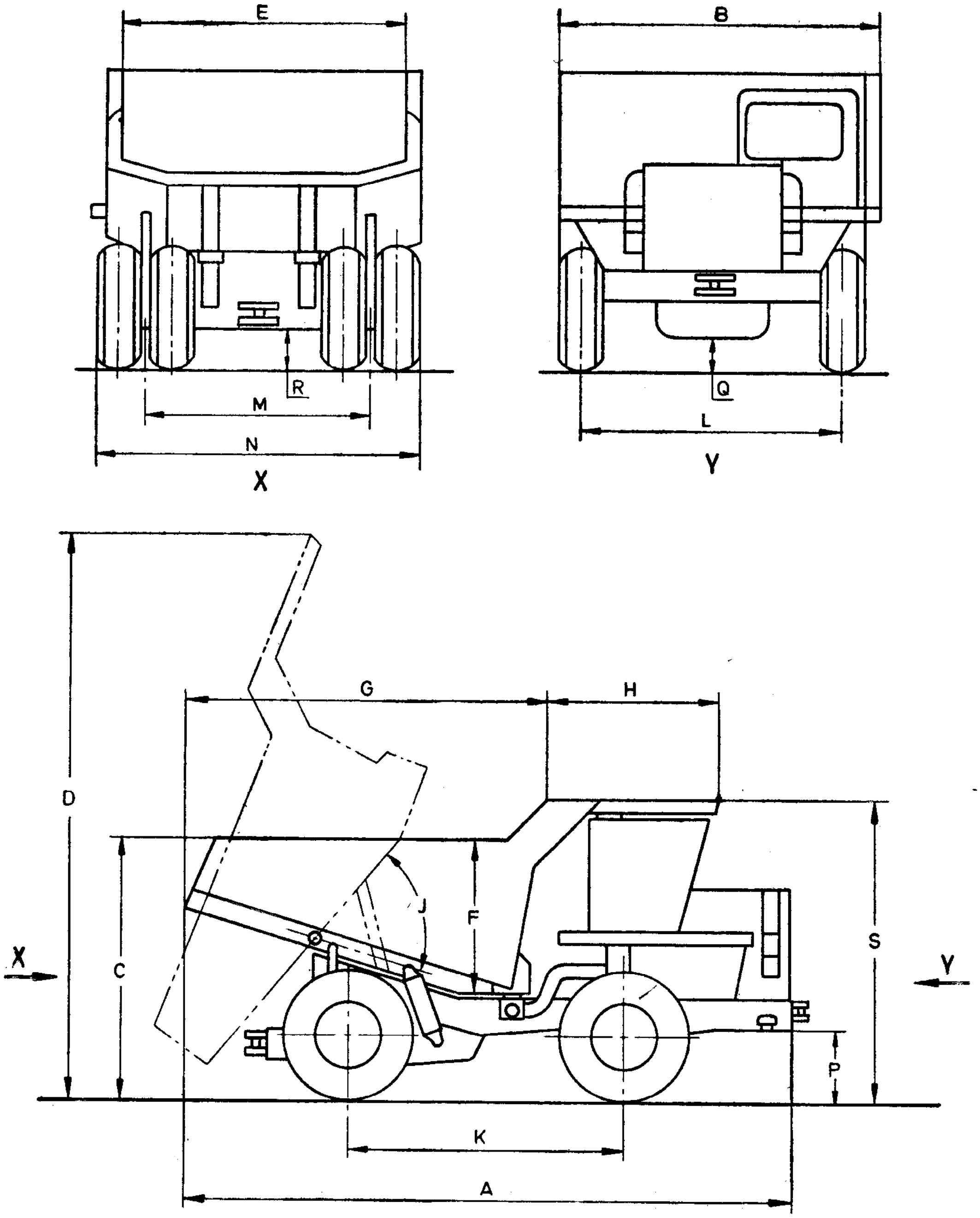

FIG. 1 DIMENSIONS OF DUMPER

EXPLANATORY NOTE

This data sheet may be used by the manufacturers and the purchasers for giving details of the dumper.

Printed at Arcee Press, New Delhi, India